IN THE CLAIMS:

Please amend claims 49-114 and 119-178 as follows.

1-48. (previously withdrawn)

49. (currently amended) A method of manufacturing a semiconductor device, comprising the steps of:

forming an amorphous semiconductor film comprising silicon as a main component over an insulating surface;

adding a catalytic element for promoting crystallization to the amorphous semiconductor film,

conducting a first heat treatment after $\frac{1}{1}$ the adding of $\frac{1}{1}$ the catalytic element, to form a crystalline semiconductor film;

forming a barrier layer over the crystalline semiconductor film;

forming a semiconductor film containing a rare gas element in a concentration of 1 \times 10¹⁹/cm³ to 1 \times 10²²/cm³ over the barrier layer;

moving the catalytic element to the semiconductor film containing the rare gas element by a second heat treatment; and removing the semiconductor film containing the rare gas element.

- 50. (currently amended) A $\underline{\text{The}}$ method according to claim 49, wherein the barrier layer is a chemical oxide film formed by ozone water.
- 51. (currently amended) A The method according to claim 49, wherein the barrier layer is formed by oxidizing a surface of the amorphous semiconductor film by a plasma treatment.
- 52. (currently amended) A The method according to claim 49, wherein the barrier layer is formed by irradiating UV-rays in an atmosphere containing oxygen to generate ozone, thereby oxidizing a surface of the amorphous semiconductor film.
- 53. (currently amended) A The method according to claim 49, wherein the barrier layer is a porous film formed with a film thickness of 1 to 10 nm.
- 54. (currently amended) A The method according to claim 49, wherein the rare gas element is at least one kind or a plurality of kinds of elements element selected from the group consisting of He, Ne, Ar, Kr, and Xe.
- 55. (currently amended) A The method according to claim 49, wherein the first heat treatment is conducted by radiation from at least one $\frac{1}{100}$ or a plurality of kinds of lamps selected

from the group consisting of a halogen lamp, a metal halide lamp, a xenon arc lamp, a carbon arc lamp, a high-pressure sodium lamp, and a high-pressure mercury lamp.

- 56. (currently amended) A $\underline{\text{The}}$ method according to claim 49, wherein the first heat treatment is conducted by using an electrothermal furnace.
- 57. (currently amended) A The method according to claim 49, wherein the second heat treatment is conducted by radiation from at least one kind or a plurality of kinds of lamps selected from the group consisting of a halogen lamp, a metal halide lamp, a xenon arc lamp, a carbon arc lamp, a high-pressure sodium lamp, and a high-pressure mercury lamp.
- 58. (currently amended) A The method according to claim 49, wherein the second heat treatment is conducted by using an electrothermal furnace.
- 59. (currently amended) A The method according to claim 49, wherein the catalytic element is at least one kind or a plurality of kinds of elements selected from the group consisting of Fe, Ni, Co, Ru, Rh, Pd, Os, Ir, Pt, Cu, and Au.

60. (currently amended) A method of manufacturing a semiconductor device, comprising the steps of:

forming an amorphous semiconductor film comprising silicon as a main component over an insulating surface;

adding a catalytic element for promoting crystallization to the amorphous semiconductor film to form a crystalline semiconductor film by a first heat treatment;

irradiating the crystalline semiconductor film with \underline{a} laser light;

forming a barrier layer over the crystalline semiconductor film <u>irradiated</u> with the laser light;

forming a semiconductor film containing a rare gas element in a concentration of 1 \times 10¹⁹/cm³ to 1 \times 10²²/cm³ over the barrier layer;

moving the catalytic element to the semiconductor film containing the rare gas element by a second heat treatment; and removing the semiconductor film containing the rare gas element.

61. (currently amended) A The method according to claim 60, wherein the barrier layer is a chemical oxide film formed by ozone water.

- 62. (currently amended) A The method according to claim 60, wherein the barrier layer is formed by oxidizing a surface of the amorphous semiconductor film by a plasma treatment.
- 63. (currently amended) A The method according to claim 60, wherein the barrier layer is formed by irradiating UV-rays in an atmosphere containing oxygen to generate ozone, thereby oxidizing a surface of the amorphous semiconductor film.
- 64. (currently amended) A The method according to claim 60, wherein the barrier layer is a porous film formed with a film thickness of 1 to 10 nm.
- 65. (currently amended) A The method according to claim 60, wherein the rare gas element is at least one kind or a plurality of kinds of elements selected from the group consisting of He, Ne, Ar, Kr, and Xe.
- 66. (currently amended) A The method according to claim 60, wherein the first heat treatment is conducted by radiation from at least one kind or a plurality of kinds of lamps selected from the group consisting of a halogen lamp, a metal halide lamp, a xenon arc lamp, a carbon arc lamp, a high-pressure sodium lamp, and a high-pressure mercury lamp.

- 67. (currently amended) A The method according to claim 60, wherein the first heat treatment is conducted by using an electrothermal furnace.
- 68. (currently amended) A The method according to claim 60, wherein the second heat treatment is conducted by radiation from at least one kind or a plurality of kinds of lamps selected from the group consisting of a halogen lamp, a metal halide lamp, a xenon arc lamp, a carbon arc lamp, a high-pressure sodium lamp, and a high-pressure mercury lamp.
- 69. (currently amended) A The method according to claim 60, wherein the second heat treatment is conducted by using an electrothermal furnace.
- 70. (currently amended) A The method according to claim 60, wherein the catalytic element is at least one kind or a plurality of kinds of elements selected from the group consisting of Fe, Ni, Co, Ru, Rh, Pd, Os, Ir, Pt, Cu, and Au.
- 71. (currently amended) A method of manufacturing a semiconductor device, comprising the steps of:

forming an amorphous semiconductor film comprising silicon as a main component over an insulating surface;

adding a catalytic element for promoting crystallization to the amorphous semiconductor film to form a crystalline semiconductor film by a first heat treatment;

forming a barrier layer over the crystalline semiconductor film;

forming a semiconductor film containing a rare gas element in a concentration of 1 \times 10¹⁹/cm³ to 1 \times 10²²/cm³ over the barrier layer;

moving the catalytic element to the semiconductor film containing the rare gas element by a second heat treatment;

removing the semiconductor film containing the rare gas element; and

irradiating the crystalline semiconductor film with \underline{a} laser light \underline{a} fter removing the semiconductor film containing the rare gas element.

- 72. (currently amended) A The method according to claim
 71, wherein the barrier layer is a chemical oxide film formed by ozone water.
- 73. (currently amended) A The method according to claim 71, wherein the barrier layer is formed by oxidizing a surface of the amorphous semiconductor film by a plasma treatment.

- 74. (currently amended) A The method according to claim 71, wherein the barrier layer is formed by irradiating UV-rays in an atmosphere containing oxygen to generate ozone, thereby oxidizing a surface of the amorphous semiconductor film.
- 75. (currently amended) A $\underline{\text{The}}$ method according to claim 71, wherein the barrier layer is a porous film formed with a film thickness of 1 to 10 nm.
- 76. (currently amended) A The method according to claim 71, wherein the rare gas element is at least one kind or a plurality of kinds of elements selected from the group consisting of He, Ne, Ar, Kr, and Xe.
- 77. (currently amended) A The method according to claim 71, wherein the first heat treatment is conducted by radiation from at least one kind or a plurality of kinds of lamps selected from the group consisting of a halogen lamp, a metal halide lamp, a xenon arc lamp, a carbon arc lamp, a high-pressure sodium lamp, and a high-pressure mercury lamp.
- 78. (currently amended) A $\underline{\text{The}}$ method according to claim 71, wherein the first heat treatment is conducted by using an electrothermal furnace.

- 79. (currently amended) A The method according to claim 71, wherein the second heat treatment is conducted by radiation from at least one kind or a plurality of kinds of lamps selected from the group consisting of a halogen lamp, a metal halide lamp, a xenon arc lamp, a carbon arc lamp, a high-pressure sodium lamp, and a high-pressure mercury lamp.
- 80. (currently amended) A The method according to claim 71, wherein the second heat treatment is conducted by using an electrothermal furnace.
- 81. (currently amended) A The method according to claim 71, wherein the catalytic element is at least one kind or a plurality of kinds of elements selected from the group consisting of Fe, Ni, Co, Ru, Rh, Pd, Os, Ir, Pt, Cu, and Au.
- 82. (original) A method of manufacturing a semiconductor device, comprising the steps of:

forming an amorphous semiconductor film comprising silicon as a main component over an insulating surface;

adding a catalytic element for promoting crystallization to the amorphous semiconductor film;

forming a barrier layer over the amorphous semiconductor film;

forming a semiconductor film containing a rare gas element in a concentration of 1 \times 10¹⁹/cm³ to 1 \times 10²²/cm³ over the barrier layer;

crystallizing the amorphous semiconductor film by a heat treatment to form a crystalline semiconductor film and moving the catalytic element to the semiconductor film containing the rare gas element;

removing the semiconductor film containing the rare gas element; and

irradiating the crystalline semiconductor film with laser light.

- 83. (currently amended) A The method according to claim 82, wherein the barrier layer is a chemical oxide film formed by ozone water.
- 84. (currently amended) A The method according to claim 82, wherein the barrier layer is formed by oxidizing a surface of the amorphous semiconductor film by a plasma treatment.
- 85. (currently amended) A The method according to claim 82, wherein the barrier layer is formed by irradiating UV-rays in an atmosphere containing oxygen to generate ozone, thereby oxidizing a surface of the amorphous semiconductor film.

- 86. (currently amended) A $\underline{\text{The}}$ method according to claim 82, wherein the barrier layer is a porous film formed with a film thickness of 1 to 10 nm.
- 87. (currently amended) A The method according to claim 82, wherein the rare gas element is at least one kind or a plurality of kinds of elements selected from the group consisting of He, Ne, Ar, Kr, and Xe.
- 88. (currently amended) A The method according to claim 82, wherein the first heat treatment is conducted by radiation from at least one kind or a plurality of kinds of lamps selected from the group consisting of a halogen lamp, a metal halide lamp, a xenon arc lamp, a carbon arc lamp, a high-pressure sodium lamp, and a high-pressure mercury lamp.
- 89. (currently amended) A $\underline{\text{The}}$ method according to claim 82, wherein the first heat treatment is conducted by using an electrothermal furnace.
- 90. (currently amended) A The method according to claim 82, wherein the second heat treatment is conducted by radiation from at least one kind or a plurality of kinds of lamps selected from the group consisting of a halogen lamp, a metal halide

lamp, a xenon arc lamp, a carbon arc lamp, a high-pressure sodium lamp, and a high-pressure mercury lamp.

- 91. (currently amended) A The method according to claim 82, wherein the second heat treatment is conducted by using an electrothermal furnace.
- 92. (currently amended) A The method according to claim 82, wherein the catalytic element is one kind or a plurality of kinds of elements selected from the group consisting of Fe, Ni, Co, Ru, Rh, Pd, Os, Ir, Pt, Cu, and Au.
- 93. (original) A method of manufacturing a semiconductor device, comprising the steps of:

adding a catalytic element for promoting crystallization to an insulating surface;

forming an amorphous semiconductor film comprising silicon as a main component over the insulating surface;

forming a barrier layer over the amorphous semiconductor film;

forming a semiconductor film containing a rare gas element in a concentration of 1 \times 10¹⁹/cm³ to 1 \times 10²²/cm³ over the amorphous semiconductor film;

crystallizing the amorphous semiconductor film by a heat treatment to form a crystalline semiconductor film and moving

the catalytic element to the semiconductor film containing the rare gas element;

removing the semiconductor film containing the rare gas element; and

irradiating the crystalline semiconductor film with laser light.

- 94. (currently amended) A The method according to claim 93, wherein the barrier layer is a chemical oxide film formed by ozone water.
- 95. (currently amended) A The method according to claim 93, wherein the barrier layer is formed by oxidizing a surface of the amorphous semiconductor film by a plasma treatment.
- 96. (currently amended) A The method according to claim 93, wherein the barrier layer is formed by irradiating UV-rays in an atmosphere containing oxygen to generate ozone, thereby oxidizing a surface of the amorphous semiconductor film.
- 97. (currently amended) A $\underline{\text{The}}$ method according to claim 93, wherein the barrier layer is a porous film formed with a film thickness of 1 to 10 nm.

- 98. (currently amended) A The method according to claim 93, wherein the rare gas element is at least one kind or a plurality of kinds of elements selected from the group consisting of He, Ne, Ar, Kr, and Xe.
- 99. (currently amended) A The method according to claim 93, wherein the first heat treatment is conducted by radiation from at least one kind or a plurality of kinds of lamps selected from the group consisting of a halogen lamp, a metal halide lamp, a xenon arc lamp, a carbon arc lamp, a high-pressure sodium lamp, and a high-pressure mercury lamp.
- 100. (currently amended) A The method according to claim 93, wherein the first heat treatment is conducted by using an electrothermal furnace.
- 101. (currently amended) A The method according to claim 93, wherein the second heat treatment is conducted by radiation from at least one kind or a plurality of kinds of lamps selected from the group consisting of a halogen lamp, a metal halide lamp, a xenon arc lamp, a carbon arc lamp, a high-pressure sodium lamp, and a high-pressure mercury lamp.

102. (currently amended) A The method according to claim 93, wherein the second heat treatment is conducted by using an electrothermal furnace.

103. (currently amended) A The method according to claim 93, wherein the catalytic element is at least one kind or a plurality of kinds of elements selected from the group consisting of Fe, Ni, Co, Ru, Rh, Pd, Os, Ir, Pt, Cu, and Au.

104. (original) A method of manufacturing a semiconductor device, comprising the steps of:

adding a catalytic element for promoting crystallization to an insulating surface;

forming an amorphous semiconductor film comprising silicon as a main component over the insulating surface;

forming a barrier layer over the amorphous semiconductor film;

forming a semiconductor film containing a rare gas element in a concentration of 1 \times 10¹⁹/cm³ to 1 \times 10²²/cm³ over the amorphous semiconductor film;

adding a rare gas element to the semiconductor film containing the rare gas element;

crystallizing the amorphous semiconductor film by a heat treatment to form a crystalline semiconductor film and moving

the catalytic element to the semiconductor film containing the rare gas element;

removing the semiconductor film containing the rare gas element; and

irradiating the crystalline semiconductor film with laser light.

- 105. (currently amended) A $\underline{\text{The}}$ method according to claim 104, wherein the barrier layer is a chemical oxide film formed by ozone water.
- 106. (currently amended) A The method according to claim 104, wherein the barrier layer is formed by oxidizing a surface of the amorphous semiconductor film by a plasma treatment.
- 107. (currently amended) A The method according to claim 104, wherein the barrier layer is formed by irradiating UV-rays in an atmosphere containing oxygen to generate ozone, thereby oxidizing a surface of the amorphous semiconductor film.
- 108. (currently amended) A $\underline{\text{The}}$ method according to claim 104, wherein the barrier layer is a porous film formed with a film thickness of 1 to 10 nm.

- 109. (currently amended) A The method according to claim 104, wherein the rare gas element is at least one kind or a plurality of kinds of elements selected from the group consisting of He, Ne, Ar, Kr, and Xe.
- 110. (currently amended) A The method according to claim 104, wherein the first heat treatment is conducted by radiation from at least one kind or a plurality of kinds of lamps selected from the group consisting of a halogen lamp, a metal halide lamp, a xenon arc lamp, a carbon arc lamp, a high-pressure sodium lamp, and a high-pressure mercury lamp.
- 111. (currently amended) A The method according to claim 104, wherein the first heat treatment is conducted by using an electrothermal furnace.
- 112. (currently amended) A The method according to claim 104, wherein the second heat treatment is conducted by radiation from at least one kind or a plurality of kinds of lamps selected from the group consisting of a halogen lamp, a metal halide lamp, a xenon arc lamp, a carbon arc lamp, a high-pressure sodium lamp, and a high-pressure mercury lamp.

- 113. (currently amended) A $\underline{\text{The}}$ method according to claim 104, wherein the second heat treatment is conducted by using an electrothermal furnace.
- 114. (currently amended) A The method according to claim 104, wherein the catalytic element is at least one kind or a plurality of kinds of elements selected from the group consisting of Fe, Ni, Co, Ru, Rh, Pd, Os, Ir, Pt, Cu, and Au.

115-118. (previously withdrawn)

- 119. (currently amended) A The method according to claim 49, wherein said the semiconductor device is a personal computer.
- 120. (currently amended) A $\underline{\text{The}}$ method according to claim 49, wherein $\underline{\text{said}}$ $\underline{\text{the}}$ semiconductor device is a video camera.
- 121. (currently amended) A The method according to claim 49, wherein said the semiconductor device is a mobile computer.
- 122. (currently amended) A The method according to claim 49, wherein said the semiconductor device is a goggle type display.

- 123. (currently amended) A The method according to claim 49, wherein said the semiconductor device is a player using a record medium.
- 124. (currently amended) A $\underline{\text{The}}$ method according to claim 49, wherein $\underline{\text{said}}$ the semiconductor device is a digital camera.
- 125. (currently amended) A The method according to claim $49_{\underline{\prime}}$ wherein said the semiconductor device is a front type projector.
- 126. (currently amended) A $\underline{\text{The}}$ method according to claim 49, wherein $\underline{\text{said}}$ $\underline{\text{the}}$ semiconductor device is a rear type projector.
- 127. (currently amended) A The method according to claim $49_{\underline{\prime}}$ wherein said the semiconductor device is a portable telephone.
- 128. (currently amended) A The method according to claim 49, wherein said the semiconductor device is an electronic book.
- 129. (currently amended) A $\underline{\text{The}}$ method according to claim 60, wherein $\underline{\text{said}}$ $\underline{\text{the}}$ semiconductor device is a personal computer.

- 130. (currently amended) A <u>The</u> method according to claim 60, wherein said the semiconductor device is a video camera.
- 131. (currently amended) A $\underline{\text{The}}$ method according to claim $60_{\underline{L}}$ wherein $\underline{\text{said}}$ $\underline{\text{the}}$ semiconductor device is a mobile computer.
- 132. (currently amended) A The method according to claim 60, wherein said the semiconductor device is a goggle type display.
- 133. (currently amended) A The method according to claim 60, wherein said the semiconductor device is a player using a record medium.
- 134. (currently amended) A $\underline{\text{The}}$ method according to claim $60_{\underline{\prime}}$ wherein $\underline{\text{said}}$ $\underline{\text{the}}$ semiconductor device is a digital camera.
- 135. (currently amended) A The method according to claim 60, wherein said the semiconductor device is a front type projector.
- 136. (currently amended) A The method according to claim 60, wherein said the semiconductor device is a rear type projector.

- 137. (currently amended) A The method according to claim 60, wherein said the semiconductor device is a portable telephone.
- 138. (currently amended) A The method according to claim 60, wherein said the semiconductor device is an electronic book.
- 139. (currently amended) A $\underline{\text{The}}$ method according to claim 71, wherein $\underline{\text{said}}$ $\underline{\text{the}}$ semiconductor device is a personal computer.
- 140. (currently amended) A $\underline{\text{The}}$ method according to claim 71, wherein $\underline{\text{said}}$ $\underline{\text{the}}$ semiconductor device is a video camera.
- 141. (currently amended) A $\underline{\text{The}}$ method according to claim 71, wherein $\underline{\text{said}}$ $\underline{\text{the}}$ semiconductor device is a mobile computer.
- 142. (currently amended) A The method according to claim 71, wherein said the semiconductor device is a goggle type display.
- 143. (currently amended) A The method according to claim 71, wherein said the semiconductor device is a player using a record medium.

- 144. (currently amended) A $\underline{\text{The}}$ method according to claim 71, wherein $\underline{\text{said}}$ $\underline{\text{the}}$ semiconductor device is a digital camera.
- 145. (currently amended) A The method according to claim $71_{\underline{\prime}}$ wherein said the semiconductor device is a front type projector.
- 146. (currently amended) A The method according to claim 71, wherein said the semiconductor device is a rear type projector.
- 147. (currently amended) A The method according to claim 71, wherein said the semiconductor device is a portable telephone.
- 148. (currently amended) A The method according to claim 71, wherein said the semiconductor device is an electronic book.
- 149. (currently amended) A The method according to claim 82, wherein said the semiconductor device is a personal computer.
- 150. (currently amended) A $\underline{\text{The}}$ method according to claim 82, wherein $\underline{\text{said}}$ $\underline{\text{the}}$ semiconductor device is a video camera.

- 151. (currently amended) A $\underline{\text{The}}$ method according to claim 82, wherein $\underline{\text{said}}$ the semiconductor device is a mobile computer.
- 152. (currently amended) A $\underline{\text{The}}$ method according to claim 82, wherein $\underline{\text{said}}$ $\underline{\text{the}}$ semiconductor device is a goggle type display.
- 153. (currently amended) A $\underline{\text{The}}$ method according to claim 82, wherein $\underline{\text{said}}$ $\underline{\text{the}}$ semiconductor device is a player using a record medium.
- 154. (currently amended) A $\underline{\text{The}}$ method according to claim 82, wherein $\underline{\text{said}}$ $\underline{\text{the}}$ semiconductor device is a digital camera.
- 155. (currently amended) A $\underline{\text{The}}$ method according to claim 82, wherein $\underline{\text{said}}$ $\underline{\text{the}}$ semiconductor device is a front type projector.
- 156. (currently amended) A The method according to claim $82_{\underline{\prime}}$ wherein said the semiconductor device is a rear type projector.

- 157. (currently amended) A $\underline{\text{The}}$ method according to claim 82, wherein $\underline{\text{said}}$ $\underline{\text{the}}$ semiconductor device is a portable telephone.
- 158. (currently amended) A The method according to claim 82, wherein said the semiconductor device is an electronic book.
- 159. (currently amended) A $\underline{\text{The}}$ method according to claim 93, wherein $\underline{\text{said}}$ the semiconductor device is a personal computer.
- 160. (currently amended) A $\underline{\text{The}}$ method according to claim 93, wherein $\underline{\text{said}}$ $\underline{\text{the}}$ semiconductor device is a video camera.
- 161. (currently amended) A $\underline{\text{The}}$ method according to claim 93, wherein $\underline{\text{said}}$ $\underline{\text{the}}$ semiconductor device is a mobile computer.
- 162. (currently amended) A The method according to claim 93, wherein said the semiconductor device is a goggle type display.
- 163. (currently amended) A The method according to claim 93, wherein said the semiconductor device is a player using a record medium.

164. (currently amended) A $\underline{\text{The}}$ method according to claim 93, wherein $\underline{\text{said}}$ the semiconductor device is a digital camera.

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- 165. (currently amended) A $\underline{\text{The}}$ method according to claim 93, wherein $\underline{\text{said}}$ the semiconductor device is a front type projector.
- 166. (currently amended) A $\underline{\text{The}}$ method according to claim 93, wherein $\underline{\text{said}}$ $\underline{\text{the}}$ semiconductor device is a rear type projector.
- 167. (currently amended) A The method according to claim 93, wherein said the semiconductor device is a portable telephone.
- 168. (currently amended) A The method according to claim 93, wherein said the semiconductor device is an electronic book.
- 169. (currently amended) A $\underline{\text{The}}$ method according to claim 104, wherein $\underline{\text{said}}$ $\underline{\text{the}}$ semiconductor device is a personal computer.
- 170. (currently amended) A The method according to claim 104, wherein said the semiconductor device is a video camera.

- 171. (currently amended) A The method according to claim 104, wherein said the semiconductor device is a mobile computer.
- 172. (currently amended) A $\underline{\text{The}}$ method according to claim 104, wherein $\underline{\text{said}}$ $\underline{\text{the}}$ semiconductor device is a goggle type display.
- 173. (currently amended) A $\underline{\text{The}}$ method according to claim 104, wherein $\underline{\text{said}}$ $\underline{\text{the}}$ semiconductor device is a player using a record medium.
- 174. (currently amended) A $\underline{\text{The}}$ method according to claim 104, wherein $\underline{\text{said}}$ $\underline{\text{the}}$ semiconductor device is a digital camera.
- 175. (currently amended) A The method according to claim 104, wherein said the semiconductor device is a front type projector.
- 176. (currently amended) A $\underline{\text{The}}$ method according to claim 104, wherein $\underline{\text{said}}$ $\underline{\text{the}}$ semiconductor device is a rear type projector.
- 177. (currently amended) A $\underline{\text{The}}$ method according to claim 104, wherein $\underline{\text{said}}$ $\underline{\text{the}}$ semiconductor device is a portable telephone.

178. (currently amended) A $\underline{\text{The}}$ method according to claim 104, wherein $\underline{\text{said}}$ $\underline{\text{the}}$ semiconductor device is an electronic book.

179-198. (previously withdrawn)